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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/285,668 04/05/99 GILTON

T M4065.135/P1

EXAMINER

MM91/0801

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QUACH, T

ART UNIT

PAPER NUMBER

2814

DATE MAILED:

08/01/00

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.

09/285,668

Applicant(s)

Gilton et al.

Examiner

Quach, T.

Group Art Unit

2814



☒ Responsive to communication(s) filed on May 15, 2000.

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire one month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

## Disposition of Claims

☒ Claim(s) 1-115 is/are pending in the application.

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☐ Claim(s) \_\_\_\_\_ is/are rejected.

☐ Claim(s) \_\_\_\_\_ is/are objected to.

☒ Claims 1-115 are subject to restriction or election requirement.

## Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been  
☐ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_.

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

☐ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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## DETAILED ACTION

### *Election/Restriction*

This application contains claims directed to the following patentably distinct species of the claimed invention:

1. The species claimed in claims 1-21, 47-69, 112, 113 regarding a method of plating a metal layer on a substrate comprising forming a barrier layer containing a reducing agent and a metal seed layer on the barrier layer by reacting the barrier layer with a first plating solution, forming a metal layer on the metal seed layer by exposing the substrate to a second plating solution.
2. The species claimed in claims 22-25, 71, 73, 74 regarding the method above, namely forming a barrier layer containing a reducing agent and a metal seed layer on the barrier layer by reacting the barrier layer with a first plating solution, forming a metal layer on the metal seed layer by exposing the substrate to a second plating solution as in the base claims and further comprising a silicon containing layer on the barrier layer. Note that a silicon layer(Si layer) is distinct from a silicon oxide (e.g., SiO<sub>2</sub> or SiO, etc.) and the claim language as written in claim 73 and 74, namely wherein the silicon layer is a layer of silicon dioxide or wherein the silicon layer is a layer of silicon monoxide is erroneous, the forming of silicon layer by oxidizing in claim 71 is deemed to claim a silicon oxide for the purpose of this action these claims are treated as if a silicon oxide is being formed on the barrier.

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3. The species claimed as in 2. above further comprising a silicon layer on the barrier layer as in claims 70 and 72; the species in this grouping corresponds to the Si layer is employed as distinct from a silicon oxide in the above grouping.
4. The species of the claimed invention in claims 26- 46 regarding a method of fabricating a conductive layer on a semiconductor substrate employing forming a silicon layer on a top surface of the substrate and forming a metal seed layer from the silicon layer by reacting the silicon layer with a first plating solution and forming a conductive layer on the metal seed layer by exposing the substrate to a second plating solution. Note that this grouping does not require any barrier containing a reducing agent or the reacting the barrier with a first plating solution.
5. The species of the claimed invention in claims 75-111, 114, 115 regarding a method of forming a metal interconnect for a semiconductor circuit comprising the steps of providing a semiconductor substrate having electronic devcies formed thereon, forming a silicon oxide layer on a top surface of the substrate and devices, forming a metal seed layer from the silicon oxide layer by reacting the silicon oxide layer with a first plating solution containing a first metal, and forming a metal interconnect layer on the metal seed layer by exposing the substrate to a second plating solution containing a second metal; the process can further include a barrier layer under the silicon oxide but the barrier does not include require any reducing agent.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, claim 1 is generic to the claims in group 1-3.

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Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

Applicant is advised that the reply to this requirement to be complete must include an election of the invention to be examined even though the requirement be traversed (37 CFR 1.143).

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any

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amendment of inventorship must be accompanied by a petition under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Quach whose telephone number is (703) 308-1096. The examiner can normally be reached on Monday through Friday from 8:30 to 5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri, can be reached on (703) 306-2794. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-7722 or (703) 308-7724.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



**Tuan Quach**  
**Primary Examiner**